

MEASURING AND ANALYZING THE IMPACT OF GDP AND PUBLIC EXPENDITURE ON THE OVERALL UNEMPLOYMENT RATE IN IRAQ FOR THE PERIOD (2003-2023)

Razan Sirwan Hameed

University of Tikrit – College of Administration and Economics, Department of Economics

Bushra Abdul Bari Ahmed

University of Tikrit – College of Administration and Economics, Department of Economics

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Abstract

This research gains its importance as it addresses unemployment, which is considered one of the major macroeconomic obstacles in Iraq. The objective of the study was to measure and analyze the impact of GDP and public expenditure on the overall unemployment rate in Iraq during the period (2003-2023). The research covered the basics of GDP, public expenditure, and the overall unemployment rate, in addition to demonstrating the relationship between these variables by analyzing the economic and econometric reality of the research variables. The descriptive method was used to analyze the data on the overall unemployment rate (UR) as the dependent variable, and the data on GDP and public expenditure (GS) as the independent variables. According to the Augmented Dickey-Fuller (ADF) test, it was found that the degree of integration of the research variables is a mix of I(0) and I(1). Therefore, the model was estimated using the Autoregressive Distributed Lag (ARDL) methodology. According to the bounds test for cointegration, there was no cointegration relationship for the model, hence the analysis was conducted only in the short term. The estimated model was successful in all standard quality tests (autocorrelation, heteroscedasticity, normal distribution of residuals), and was also stable according to the CUSUM and CUSUM OF SQUARE tests. The main findings of the research were that the structure of Iraq's GDP still suffers from significant imbalance, the size of public expenditure in Iraq largely depends on the increase in oil revenues, and the average overall unemployment rate during the study period was 11.2%, which is higher than the globally acceptable rates of 2% - 5%. The research provided several recommendations, most notably that Iraq should work on diversifying its sources of income and increasing the contribution of non-oil activities to its GDP and revenues to prevent them from being affected by fluctuations in global oil prices. Iraq should develop future plans to reduce overall unemployment rates, absorb the increase in the labor force, focus on education and technological development, and give the private sector more opportunities to increase its contribution to economic activity to provide more job opportunities and absorb more labor force. Additionally, Iraq should increase investment in all sectors

and raise the percentage of government investment expenditure to reduce the unemployment rate and prevent its development and repercussions.

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Introduction:

Unemployment is one of the most serious problems facing the Iraqi economy due to its economic, social, and political impacts. It represents a waste of human resources and signals a flaw in the social and political systems. Unemployment indicates that the state is unable to fulfill its duties toward its citizens amid its fragile structure and threatened sovereignty. Under these conditions, unemployment creates a fertile ground for the growth of terrorism and extremism. The state's policy of absorbing workers into state apparatuses, especially security forces, has failed to accommodate the increasing labor force, resulting in negative outcomes such as hidden unemployment in the public sector. This makes combating unemployment even more challenging due to the negative repercussions it generates. Addressing and reducing unemployment requires exceptional efforts and a package of integrated policies aimed first at labor market reform and the reform of labor-absorbing sectors, particularly the productive sectors of industry and agriculture, as well as the private sector. The Iraqi economy has suffered destruction from three wars, followed by war and terrorist activities after the change in April 2003. Uncontrolled openness policies have led to a significant increase in imports, a shortfall in local supply, a near-total halt in production, and a decline in exports (except for oil). With the growth in oil exports, symptoms of the Dutch disease appeared, making agricultural products uncompetitive with imported goods and causing the country to rely entirely on foreign markets. These economic reasons, along with the deterioration of the security situation, the heavy legacy of previous regimes, high population growth rates, and the decline of the educational system, have contributed to the spread of unemployment. Iraq suffers from high unemployment rates, with the globally acceptable unemployment rate being between 2% and 5%, while the unemployment rate in Iraq exceeded 16% in 2022.

1. Research Problem:

The main research problem stems from the following central question: What is the impact of GDP and public expenditure on the unemployment rate in Iraq?

2. Importance of the Research:

The importance of the research lies in the fact that unemployment is one of the major obstacles to the macroeconomy in Iraq. It is the greatest challenge faced by societies, and studying its effects helps support the development process to prevent the spread of poverty in the country.

3. Research Objective:

The research aims to measure the impact of GDP and public expenditure on the unemployment rate and to test the relationship between these variables in Iraq for the period (2003-2023), providing recommendations to help policymakers reduce unemployment.

4. Research Hypotheses:

The research is based on the hypothesis that GDP growth positively affects the unemployment rate in Iraq during the study period, as follows:

H0: There is no statistically significant impact of GDP and public expenditure on the unemployment rate in Iraq.

An alternative hypothesis states:

H1: There is a statistically significant impact of GDP and public expenditure on the unemployment rate in Iraq.

5. Research Methodology:

The research methodology relies on three main consistent approaches as follows:

- a) **Descriptive Approach:** This underpins the theoretical framework of the concepts of unemployment, GDP, and public expenditure, and clarifies the relationships between them.
- b) **Analytical Approach:** This approach analyzes the reality of the unemployment rate, GDP, and public expenditure.
- c) **Econometric Approach:** This approach employs modern econometric methods and techniques using the statistical program (E-views 12) to analyze the relationships between the independent variables and the dependent variable.

6. Research Boundaries:

The research scope includes two directions:

1. **Spatial Boundaries:** The Iraqi economy.
2. **Temporal Boundaries:** The period (2003-2023).

First Axis: Conceptual Aspect of GDP, Public Expenditure, and Unemployment Rate

1. The Essence of GDP:

1. Concept and Definition of GDP:

GDP is one of the most important concepts in macroeconomics because it is the most comprehensive and widely used criterion for calculating economic growth rates. It represents the sum of economic activities produced by a society over a specific period. It was first developed as an indicator by economist Simon in his report to the U.S. Congress in 1934. GDP reflects the economic performance level of a state, being high during prosperity and low during recessions. Therefore, GDP is currently used to compare the economic performance of countries and to forecast future conditions (Magdy, 2021, 8).

GDP is defined as "the total market value of all final goods and services produced within an economy over a specific period, usually a year" (Al-Sheikhly, 2019, 45).

It is also defined as "the value of all goods and services produced within the geographical boundaries of a country by its citizens or foreigners" (Sahnoun, 2010, 86).

2. Determinants of GDP:

GDP, which reflects the level of local economic activity, is influenced by surrounding conditions, which are (Al-Salman and Al-Bakr, 2016, 29):

- a) **Natural Conditions and Disasters:** These significantly affect economic activity as they are beyond human control and predictions. They include unpredictable and uncontrollable events such as earthquakes and floods.
- b) **Unstable Political and Security Conditions:** Wars, which cause factories to stop and fluctuations in the quantity of locally produced goods and services, have a destructive impact on GDP because they affect most of its constituent activities.
- c) **Economic Resources Used in Production:** The quantity and quality of locally produced goods determine GDP value. The GDP increases with quality and decreases with poor quality.
- d) **The Degree of Labor Division within the State:** The level of technological advancement used in production also influences GDP.

3. Calculation of GDP:

GDP equals the value of all goods and services produced in a country, minus the value of goods and services used in production processes, known as (intermediate consumption). Countries calculate GDP for a given year using one of the following methods (Magdy, 2021, 10-13):

a) GDP by Production Approach:

This method focuses on the aggregate supply side. GDP is calculated according to its constituent sectors by summing the differences between the total values of final goods and services produced and the values of intermediate goods and services used in producing these same goods and services. Hence, it is also known as the value-added method. The value-added is calculated for all sectors, and the sum of these values is the GDP.

b) GDP by Expenditure Approach:

This method focuses on the aggregate demand side. GDP is calculated by summing total private and public domestic consumption, total private and public domestic investment, and net exports. Their sum equals the GDP (Feil & Schreiber, 2017, 676).

c) GDP by Income Approach:

This method focuses on the returns to factors of production, which include labor, land, capital, and entrepreneurship. It involves summing total wages, total land rents, total interest on capital, and total profits from management and entrepreneurship. The sum of these returns is the GDP.

2. The Essence of Public Expenditure:

1. Concept and Definition of Public Expenditure:

The role of the state in economic activity is a highly debated topic. The development of public expenditure theories stems from its economic, social, and environmental impacts. Neutral public finance refers to a financial system prevalent in a certain political situation during a specific period. Traditional thought viewed government spending as neutral and unproductive, believing that individual initiative and the price mechanism were best suited to achieve the highest possible level of economic welfare for individuals and society. This would occur if individuals were allowed to work, own, and move without state intervention in their economic activities (Al-Sharabi, 2013, 197; Al-Jubouri & Al-Ramli, 2021, 24).

Public expenditure is an amount of money disbursed from the state treasury to satisfy a public need. It is defined by its monetary nature, the entity disbursing it, and its aim to satisfy a public need (Bou Jelal, 2018, 244-245).

Public expenditure is defined as "an amount of money paid by the public treasury to satisfy a public need, determined by its monetary nature, the entity responsible for it, and its goal to meet a public need" (Abboud, 2022, 213).

2. Objectives of Public Expenditure:

Countries around the world aim to achieve the objectives of public expenditure to foster an economic reality capable of fulfilling societal goals and meeting public needs. These objectives are:

- a) To understand the impact of government spending on the economic, social, and political lives of individuals for guidance.
- b) During periods of recession, government spending aims to increase effective demand by employing as many workers as possible in service and production projects. These workers receive wages, which they then spend on goods and services to satisfy their needs, thereby increasing effective demand. As employment and distributed incomes, especially for those with limited incomes who

have a high marginal propensity to consume, continue to rise, there will be a further increase in effective demand. This increase will absorb the surplus of goods and services in the market, prompting businesses to expand their production and leading to higher economic growth rates (Zughair, 2017, 4).

- c) To establish important rules upon which public expenditure policy relies, aligning with the government's economic policy.
- d) To aim for income development and maintenance through public expenditure alongside private spending, which increases purchases of goods and services. This results in additional demand for the productive resources used, including labor, capital, organization, and innovation (Zerouat and Manat, 2016, 6-8).

3. The Essence of Unemployment:

1. Concept and Definition of Unemployment:

Unemployment is a social and economic problem that arose with the increase in population and the inability of resources to meet needs. It has become more acute with technological advancement and the automation of production. Today, unemployment is one of the main problems facing most countries worldwide, regardless of their levels of development and their economic, social, and political systems. The continuity of states depends on how well they provide resources to individuals along with continuous support and services. When some segments of society cannot find work, it becomes a factor in the collapse of these states, as seen with the feudal system. Unemployment is one of the most serious and significant problems threatening the stability of states, varying in scope and severity from one country to another and from one society to another (Saleh, 2023, 184).

Unemployment is also the primary cause of most social impacts and represents a clear threat to politics. Its severity varies from one society to another, and it is the main cause of most social effects and poses a threat to security and political stability (Al-Janahi, 2021, 449).

Unemployment is defined as a social and economic problem that manifests in the marginalization of a large number of people who are willing to work, either due to the scarcity of available job opportunities or an excess of available workers over job opportunities. A society that cannot employ all its capable members is like a living organism that cannot use all its parts. It is difficult to imagine the financial and moral decline of an unemployed person without envisioning a situation where even those with high salaries cannot meet all their essential needs. Unemployment is also defined as the condition describing an individual who cannot find work despite continuously seeking employment. Another definition of unemployment is the presence of people in a society who are capable of working and have made various efforts to find a job but have not secured a suitable opportunity. Unemployment negatively impacts society and is prevalent among young people who have the ability to work. It is not applicable to the elderly, children, or individuals with mental, psychological, or physical conditions that prevent them from performing any type of work, which poses barriers for them. These individuals are classified as being outside the labor force (Zaidan & Abdul Hussein, 2022, 7-8).

3. Types of Unemployment:

Unemployed individuals are classified into various categories, the most important of which are (Al-Maksousi, 2023, 20), (Bashar, 2021, 68), (Mujahid, 2014, 101), (Assiri, 2018, 556), and (Al-Breifkani et al., 2010, 219-220):

- A. **Frictional Unemployment:** This type of unemployment occurs when individuals voluntarily leave their jobs to seek better opportunities. Workers might move from one geographic area to another or from one profession to a new one, requiring a period of time. These changes are referred to as the natural evolution of the labor market. Additionally, new entrants into the labor market each year include university and institute graduates of working age. Some unemployed individuals are

temporarily without work because they cannot find jobs that match their skills.

- B. **Structural Unemployment:** This type of unemployment arises from periodic shifts in the economic structure. In developed countries, it is a temporary condition that resolves over time as workers adapt, retrain, and acquire new skills. In developing countries, however, it is a chronic issue that worsens over time and requires fundamental economic reforms and solutions.
- C. **Disguised Unemployment:** This refers to the presence of more workers than are needed for the current level of production, where the marginal productivity of the excess labor is zero. This type of unemployment is common in densely populated countries and large government institutions and is used as a solution to societal unemployment problems.
- D. **Cyclical Unemployment:** This unemployment occurs during periods of economic recession before actual production reaches sufficient productive capacity. When demand for production declines, expenditures at prevailing prices related to the recession can lead to the partial or complete shutdown of some projects and the dismissal of part of the workforce simultaneously.
- E. **Seasonal Unemployment:** This type of unemployment is dependent on climate and social seasons, with a large portion of the labor force remaining unemployed at various times of the year. There are differences in this type of unemployment depending on the level of economic and social development.
- F. **Technological Unemployment:** This means that the demand for certain types of skills arises for the production of goods, particularly for a booming industry, while the demand for other types of labor declines due to the recession affecting the industry, which is caused by structural changes in demand.
- G. **Forced Unemployment:** This is the involuntary unemployment of workers. Government decisions can lead to involuntary unemployment, causing many people to lose their jobs. These individuals are forced to leave their jobs and remain unemployed, and involuntary unemployment can result from war, among other factors.
- H. **Voluntary Unemployment:** This refers to individuals who have the ability to work but lack the desire to work at the prevailing wage level. This means there are certain jobs available, but they do not want to work in them because the wages offered are lower than what they desire.

Section Two: The Reality of GDP, Public Spending, and Unemployment Rate in Iraq

First. Analysis of the Reality of GDP in Iraq:

Table (1) shows the developments in Iraq's GDP during the period 2003-2023. We observe that it was continuously increasing during the period 2003-2008. Starting from (33,716,173 million dinars) in 2003, it continued to rise to (157,026,062 million dinars) in 2008, with an average annual growth rate of (41%). This continuous increase is attributed to the constant rise in the number of barrels of crude oil produced and exported, as well as the continuous increase in global oil prices (Annual Economic Report of the Central Bank of Iraq, 2008, 18-19).

In 2009, however, Iraq's GDP decreased to (130,643,200 million dinars) with a negative annual growth rate of (-17%). This decrease was due to the repercussions of the global subprime mortgage crisis, which affected global oil prices (Annual Economic Report of the Central Bank of Iraq, 2009, 9).

During the period 2010-2013, Iraq's GDP continuously increased. From (162,064,566 million dinars) in 2010 with a positive annual growth rate of (24%), it continued to rise to (273,587,529 million dinars) in 2013 with a positive annual growth rate of (8%). This continuous increase is attributed to the constant rise in the number of barrels of crude oil produced and exported, along with the significant and continuous increase in its global prices, reaching levels above (100 dollars per barrel). However, in 2014 and 2015, Iraq's GDP continuously decreased to (266,332,655 million dinars) and (194,680,972

million dinars) with negative annual growth rates of (-3%) and (-27%) respectively. This continuous decrease is attributed to the repercussions of the dual crisis experienced by the Iraqi economy, represented by the events of June 9, 2014, in addition to the significant drop in global oil prices, reaching very low levels due to the decline in global demand for oil following the increase in the United States' reserves (Annual Economic Report of the Central Bank of Iraq, 2015, 16-19).

Table (1): Developments in Iraq's GDP during the period 2003-2023

Year	GDP (Million Dinars)	Annual Growth Rate (%)
2003	33716173	----
2004	53235359	58
2005	73533599	38
2006	95587955	30
2007	111455813	17
2008	157026062	41
2009	130643200	-17
2010	162064566	24
2011	217327107	34
2012	254225491	17
2013	273587529	8
2014	266332655	-3
2015	194680972	-27
2016	196924142	1
2017	221665710	13
2018	268918874	21
2019	276157868	3
2020	215661517	-22
2021	301152819	40
2022	383064152	27
2023	464975485	21

Source: Data from the Central Bank of Iraq published on the bank's statistical website on 1/3/2024

During the period (2016-2019), Iraq's GDP increased continuously. Starting at 196,924,142 million dinars in 2016 with a positive annual growth rate of 1%, it continued to rise, reaching 276,157,868 million dinars in 2019 with a positive annual growth rate of 3%. This continuous increase is attributed to the relative recovery in global oil prices, despite very low GDP growth rates. In 2020, Iraq's GDP decreased to 215,661,517 million dinars with a negative annual growth rate of -22%, due to the impacts of the COVID-19 pandemic and the decline in global demand for crude oil as countries closed most of their factories, leading to a drop in oil prices and Iraqi oil revenues. During the period (2021-2023), Iraq's GDP continued to rise, starting at 301,152,819 million dinars in 2021 with a positive annual growth rate of 40%, and increasing to 464,975,485 million dinars in 2023 with a positive annual growth rate of 21%. This growth followed the gradual reduction of the COVID-19 threat and the ongoing rise in global oil prices, which reached \$100 per barrel in 2022 (Annual Economic Report of the Central Bank of Iraq, 2022, pp. 13-14).

Figures (1) and (2) below provide a more detailed analysis of the GDP data mentioned above:

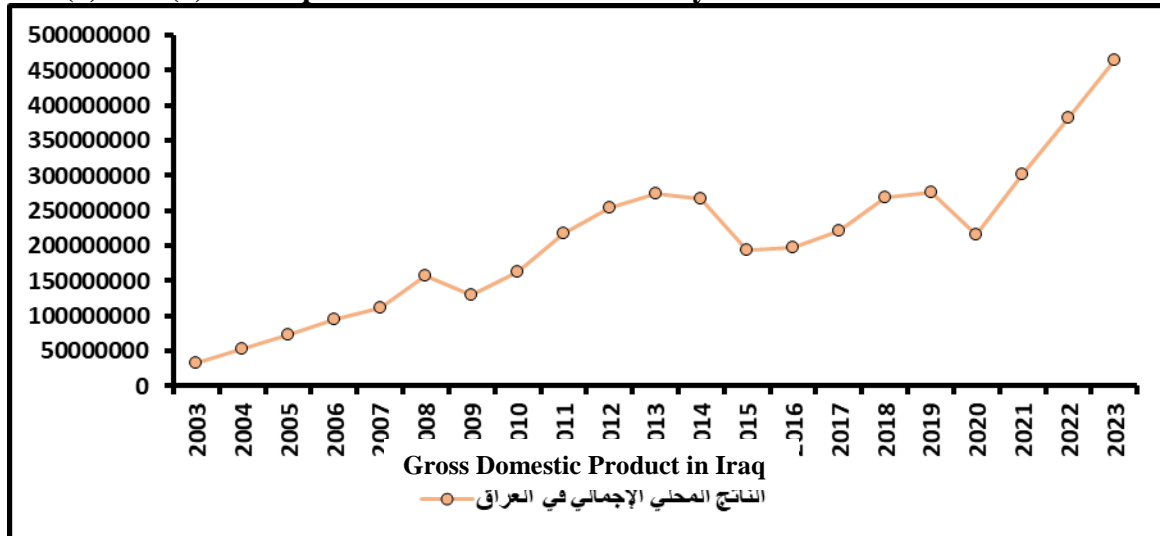


Figure (1): Developments in Gross Domestic Product in Iraq for the period (2003-2023)

Second. Analysis of Public Spending in Iraq for the Period (2003-2023):

The analysis of public spending and the calculation of the annual growth rate are illustrated in Table (2), which shows public spending in Iraq for the period (2003-2023). It is evident that public spending increased in 2003 and 2004. After being at (9,232,300 million dinars) in 2003, it significantly rose to (32,117,491 million dinars) in 2004, with a very high positive annual growth rate of (248%), the highest rate during the study period. This substantial increase in spending was due to the need for more expenditure by public institutions, especially after they were subjected to bombing or destruction during the Third Gulf War in 2003 and the subsequent events. In 2005, public spending decreased to (26,375,175 million dinars) with a negative annual growth rate of (-18%).

During the period (2006-2008), public spending showed a continuous increase. After reaching (38,806,679 million dinars) in 2006 with a positive annual growth rate of (47%), it continued to rise, reaching (59,403,375 million dinars) in 2008 with a positive annual growth rate of (52%). This increase was due to the continuous rise in the quantities of crude oil produced and exported, as well as the ongoing rise in global oil prices, which certainly contributed to increased public revenues and, consequently, higher government spending (Central Bank of Iraq Annual Economic Report, 2008, 38-39).

In 2009, public spending recorded a notable decrease to (52,567,025 million dinars) with a negative annual growth rate of (-12%). This decline was attributed to the repercussions of the global mortgage crisis, which negatively affected global oil prices, leading to decreased public revenues and, thus, reduced public spending. During the period (2010-2013), public spending increased continuously and at an accelerating pace, especially in 2012 and 2013. After being (64,351,984 million dinars) in 2010 with a positive annual growth rate of (22%), it continued to rise, reaching (106,873,027 million dinars) in 2013 with a positive annual growth rate of (18%). This continuous increase was due to the significant rise in the number of employees and the substantial increase in investment expenditures. Notably, the expansion in public spending during this period was due to the large increase in public revenues caused by the significant rise in global oil prices, reaching levels above (100 dollars per barrel).

Table (2): Developments in Public Spending in Iraq for the Period (2003-2023)

Year	Public Spending (Million Dinars)	Annual Growth Rate (%)
2003	9232300	-----
2004	32117491	248
2005	26375175	-18
2006	38806679	47
2007	39031232	1
2008	59403375	52
2009	52567025	-12
2010	64351984	22
2011	69639523	8
2012	90374783	30
2013	106873027	18
2014	83556226	-22
2015	70397515	-16
2016	67067437	-5
2017	75490115	13
2018	80873189	7
2019	111723523	38
2020	76082443	-32
2021	102849659	35
2022	116959582	14
2023	131069505	12

Source: Data from the Central Bank of Iraq published on the bank's statistical website on March 1, 2024

During the period (2014-2016), public spending experienced a continuous decline. After being at (83,556,226 million dinars) in 2014 with a negative annual growth rate of (-22%), it continued to decrease, reaching (67,067,437 million dinars) in 2016 with a negative annual growth rate of (-5%). This decline was due to the repercussions of the events of June 9, 2014, and the accompanying drop in global oil prices.

However, during the period (2017-2019), public spending increased continuously. After reaching (75,490,115 million dinars) in 2017 with a positive annual growth rate of (13%), it continued to rise, reaching (111,723,523 million dinars) in 2019, the highest value during the study period, with a positive annual growth rate of (38%). This increase was attributed to the relative recovery in global oil prices, which led to increased operational expenditures due to significant growth in grants, subsidies, and debt

services, as well as increased investment spending, specifically in capital expenditures, service supplies, and commodity supplies. This was in contrast to previous years when spending was limited due to austerity measures by the former Iraqi government during the period (2014-2018) due to low global oil prices.

In 2020, public spending decreased following a reduction in both operational and investment expenditures, reaching (76,082,443 million dinars) with a negative annual growth rate of (-32%), the lowest annual growth rate during the study period. This decline was due to the impacts of the COVID-19 pandemic and the suspension of all investment expenditures on projects. However, with the gradual recovery, public spending increased continuously during the period (2021-2023). After reaching (102,849,659 million dinars) with a positive annual growth rate of (35%), it continued to rise, reaching (131,069,505 million dinars) with a positive annual growth rate of (12%).

Figures (3) and (4) below show our analysis of the developments in public spending in Iraq as follows:

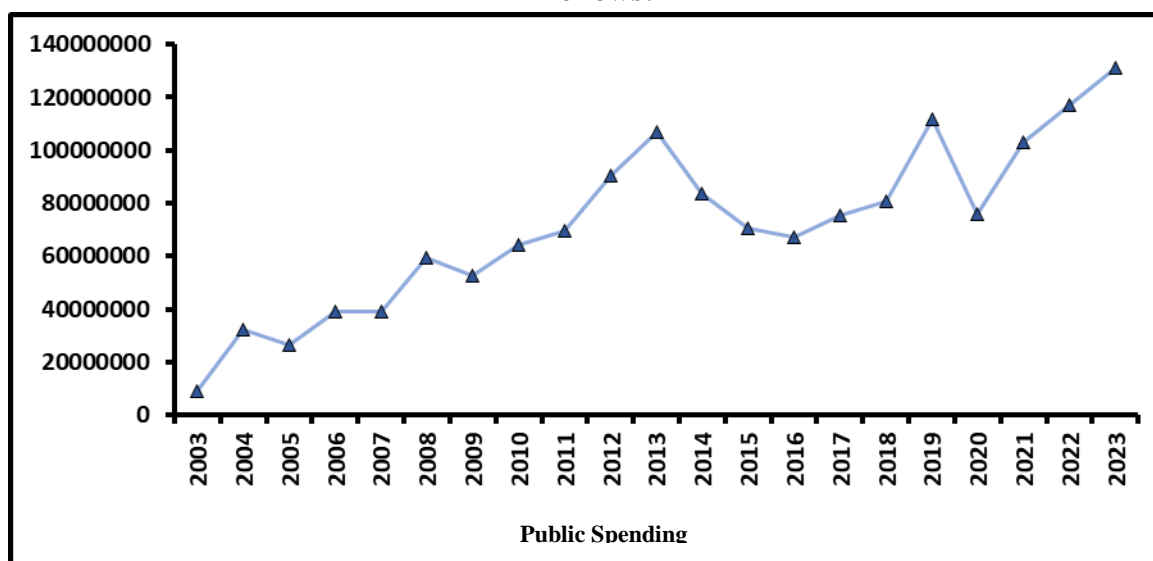


Figure (2): Developments in Government Spending in Iraq for the Period (2003-2023)

Source: Researcher's work based on data from Table (2)

Second: Developments in the Overall Unemployment Rate in Iraq

Table (3) below shows the reality of the overall unemployment rate in Iraq during the period (2003-2023). We observe that it decreased in 2004, from 8.85% in 2003 to 8.61% in 2004. In 2005, it increased slightly to 8.72%, but it generally decreased during the period (2006-2012), with a notable stabilization in 2007. After being 8.65% in 2006, it continued to decrease, reaching 7.96% in 2012, due to the expansion of economic activity.

During the period (2013-2020), the overall unemployment rate increased, rising from 9.26% in 2013 to 16.23% in 2020. This continuous increase was due to fluctuations in economic activity in Iraq, caused by the aftermath of the events of June 9, 2014, and significant fluctuations in global oil prices. Additionally, the near-total halt of all economic activities due to the impact of the COVID-19 pandemic in 2020 contributed to this rise.

In 2021 and 2022, the overall unemployment rate in Iraq decreased continuously to 16.17% and 15.55%, respectively. This decline was attributed to the gradual end of the COVID-19 crisis and the recovery of global oil prices.

Table (5) below shows that the total population of Iraq increased continuously throughout the study period (2003-2023). Starting at 13,588,897 in 2003, it grew to 22,675,321 by 2023, with an annual growth rate of 2.1%. There was a slight decrease in 2007, with the population at 14,407,413 and a negative annual growth rate of -0.8%, the lowest during the study period, due to deteriorating security conditions. The highest annual growth rate was 4.7% in 2013. The number of working-age females in Iraq also increased continuously during the study period, starting at 7,405,997 (the lowest value) in 2003 and rising to 13,548,162 (the highest value) by 2023, with a slight decrease in 2007 to 7,998,079.

Table (3): Developments in Unemployment Rates in Iraq for the Period (2003-2023)

Year	Male Unemployment Rate (%)	Female Unemployment Rate (%)	Overall Unemployment Rate(%)
2003	8.98	7.99	8.85
2004	8.74	7.72	8.61
2005	8.89	7.69	8.72
2006	8.84	7.55	8.65
2007	8.87	7.44	8.65
2008	8.49	8.42	8.48
2009	8.21	9.46	8.40
2010	7.87	10.45	8.25
2011	7.54	11.45	8.13
2012	7.18	12.41	7.96
2013	7.81	17.14	9.26
2014	8.40	21.81	10.59
2015	8.45	22.01	10.73
2016	8.45	22.13	10.82
2017	10.19	30.74	13.02
2018	11.72	28.74	14.07
2019	13.25	26.71	15.11
2020	14.36	27.90	16.23
2021	14.22	28.19	16.17
2022	13.38	28.46	15.55
2023	13.54	28.73	15.19

Source: World Bank data published on the bank's website on March 1, 2024.

Figure (5) shows our analysis above in more detail.



Figure (3): Trends in the Overall Unemployment Rate in Iraq for the Period (2003-2023)

Source: Prepared by the researcher based on data from Table (3)

Section Three: Measuring and Analyzing the Impact of GDP Growth and Public Spending on the Unemployment Rate

1. Model Description:

The variables were logarithmically transformed, and the dependent variable of the estimated model is as follows:

1. Time Series of GDP Growth Rate (UR).

The independent variables in the estimated model were:

2. Time Series of Overall Unemployment Rate (GDP).

3. Time Series of Public Spending (GS).

$$UR = f(GDP, GS)$$

Second . Results of Stationarity Tests:

Table (4): Results of the Dickey-Fuller Test for Stationarity

First Difference			Level			Variables	
Without Constant & Trend	Constant & Trend	Constant	Without Constant & Trend	Constant & Trend	Constant		
0.018	0.336	0.104	0.975	0.631	0.951	UR	1
0.006	0.138	0.033	0.998	0.169	0.075	GDP	2
0.000	0.003	0.000	0.987	0.001	0.001	GS	3

Source: Researcher's work based on E-Views12 program outputs

Table (4) shows the results of the Phillips-Perron tests for stationarity. We observe that the results at level indicate that the time series for the unemployment rate (UR) and the time series for GDP were not stationary at any equation. However, the time series for government spending was stationary at the constant term equation and the constant term and trend equation at a significance level of 1%. At the first difference, the results indicate that the time series for the two model variables were stationary. Specifically, the time series for the overall unemployment rate was stationary at the equation without a constant or trend term at a significance level of 5%. Meanwhile, the time series for GDP was stationary at the constant term equation at a significance level of 5%, and also at the equation without a constant or trend term at a significance level of 1%. The time series for government spending was stationary at all three equations at a significance level of 1%.

Third. Results of the Standard Tests for the Model:

1. Standard Problems and Model Quality Tests:

Table (5) shows that the p-value for the Chi-Square test related to the problem of autocorrelation was (0.1522), which means we accept the null hypothesis that the model does not suffer from this problem, as it is greater than (0.05). The p-value for the Chi-Square test concerning the problem of heteroscedasticity was (0.8204), which is also greater than (0.05), indicating that the model does not suffer from this issue. The p-value for the Jarque-Bera statistic was (0.6691), indicating that the

residuals of the research model followed a normal distribution. The R-squared value was (0.9963), and the adjusted R-squared value was (0.9884), which represent the explanatory power of the model. This means that the independent variables explain (98%) of the variations in the dependent variable. The Durbin-Watson statistic was (2.2110).

Table (5): Tests for Standard Problems and Model Quality

Breusch-Godfrey Serial Correlation LM Test	
Autocorrelation Test	
Prob. F (1,19)	0.3820
Prob. Chi-Square (1)	0.2817
Heteroskedasticity Test: ARCH	
Prob. F(1,61)	0.0609
Prob. Chi-Square(1)	0.0605
Normal Distribution (Histogram-Normality test)	
Jarque-Bera	0.1154
Model quality tests	
R-squared (R²)	0.9999
Adjusted R-squared (R²)	0.9999
Durbin-Watson stat (DW)	2.1149

Source: Researcher's work based on the outputs from E-Views12

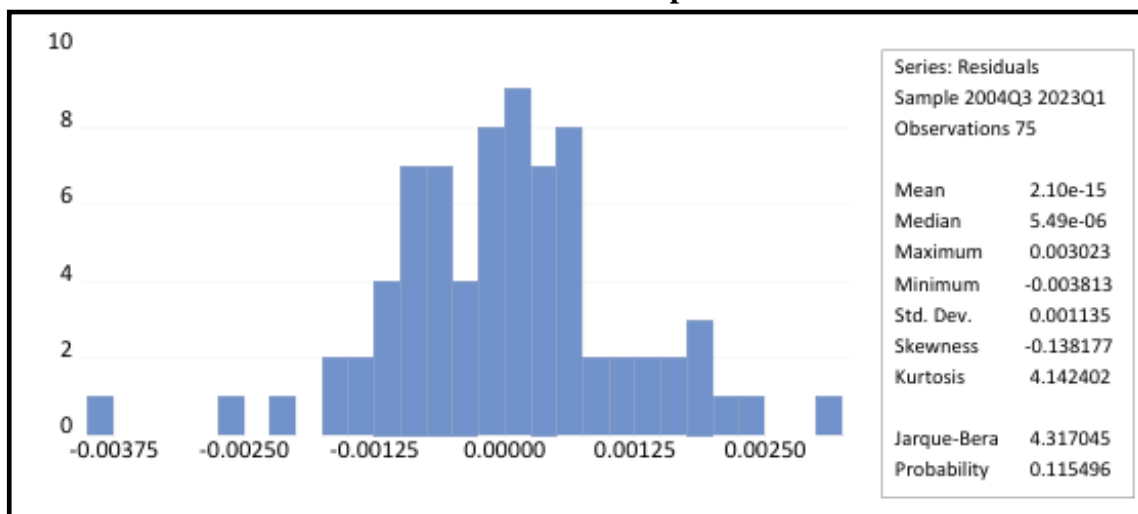


Figure (4): Normal Distribution of Model Residuals

Source: E-Views12 Outputs

2. Cointegration Test (Bounds Test):

Table (6): F-Bounds Test for Cointegration

Test Statistic	Value	K
F-statistic	3.6550	1
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	4.19	5.06
5%	4.87	5.85

2.5%	5.79	6.59
1%	6.34	7.52

Source: Researcher's work based on E-Views12 outputs

Table (6) shows that the research model does not possess the property of long-term cointegration, so the relationship will be analyzed only in the short term. This is because the F-statistic value was 3.6550, which is smaller than all upper and lower bounds at all levels (1% - 10%).

3. Short-Term Model Results Analysis:

Table (7): Short-Term Elasticities and Error Correction Coefficient

Short term				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP)	- 0.150	0.040	- 3.746	0.000
D(GS)	0.062	0.024	2.539	0.013

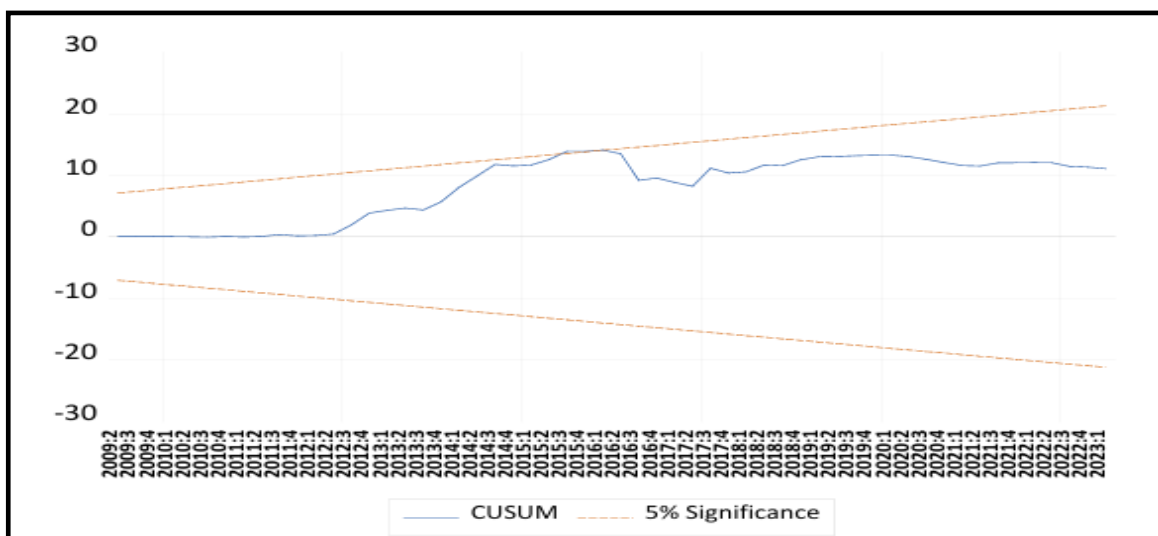
Source: Researcher's work based on E-Views12 outputs

Table (7) shows the results of short-term elasticities. We observe that the time series of Gross Domestic Product (GDP) had an inverse relationship with the overall unemployment rate (UR), meaning that a 1% increase in GDP would lead to a 0.15% decrease in the overall unemployment rate. This relationship was highly significant at the 1% level with a p-value of 0.000, which is consistent with economic theory. An increase in GDP tends to expand all economic activities, thus absorbing unemployment and lowering its rate.

We also observe that the time series of public spending (GS) had a positive relationship with the overall unemployment rate (UR). Specifically, a 1% increase in public spending would result in a 0.062% increase in the overall unemployment rate. This relationship was significant at the 5% level with a p-value of 0.013, which aligns with economic theory. An increase in the ratio of operational public spending to total public spending, at the expense of a decrease in the ratio of investment public spending to total public spending, leads to reduced investment and the failure of spending policies to absorb unemployment, thereby increasing its rate.

5. Model Stability Test:

Figure (5) shows the cumulative sum of residuals for the research model, indicating that the model was stable throughout the study period. Stability is demonstrated by the cumulative series remaining within the critical bounds.



"Figure (5): Cumulative Sum of Residuals (Cusum) Test"

Source: Outputs from E-Views12

Figure (6) shows the cumulative sum of residuals for the research model. The stability of the model is reflected in the fact that the cumulative series remains within the critical boundaries, indicating that the research model was stable throughout the study period, except for the period from the third quarter of 2017 to the fourth quarter of 2019. During this time, the Iraqi government implemented austerity measures that reduced public spending, particularly on investments. Additionally, crude oil prices saw a significant decline in 2017, leading to a decrease in GDP, as well as an exit in the second quarter of 2012.

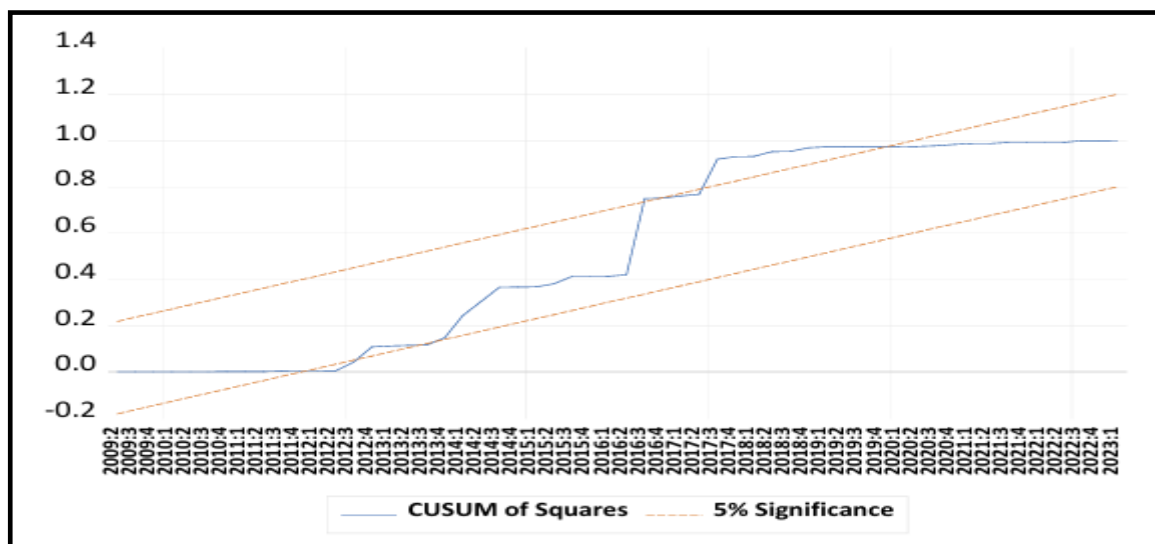


Figure (5): Cusum of Squares Test

Source: Outputs from E-Views12**Conclusions:**

1. The structure of Iraq's GDP still suffers from significant imbalances, as it relies heavily on the oil sector for its composition.
2. The volume of public spending in Iraq is highly dependent on increases in oil revenue. While it generally increased, it declined during the period (2014-2016) and in 2020 due to crises, security disturbances, and health issues that led to a drop in global oil prices.
3. The average overall unemployment rate during the study period was 11.2%, which is higher than the globally acceptable range of 2% - 5%. It was 8.54% in the first half of the study period but rose to 13.75% in the second half, indicating weak planning in Iraq and the lack of a successful plan to absorb the increasing workforce.

Recommendations:

1. Iraq should work on diversifying its income sources and increasing the contribution of non-oil activities to its GDP, revenues, and public spending to mitigate the impact of global oil price fluctuations.
2. Iraq needs to develop future plans to reduce overall unemployment rates, absorb the increase in the workforce, and focus on education and technological development.
3. Iraq should provide more opportunities for the private sector and increase its contribution to economic activity to create more job opportunities and accommodate a larger workforce.
4. Efforts should be made to raise investment levels across all sectors and increase government

investment spending to reduce the unemployment rate and prevent its escalation and related consequences.

Arabic references:

1. Al-Barevkani, A. M. I., et al. (2010). The phenomenon of unemployment among graduates of Duhok University Colleges (causes and solutions). Published research, Rafidain Development Journal, 32(100), Duhok, Iraq.
2. Bashar, D. M. (2021). Geographical analysis of economic activity and unemployment indicators in Iraq. Published research, Al-Israa University College Journal of Social and Human Sciences, 3(6), Baghdad, Iraq.
3. Bou Jalal, A. (2018). Procedures for implementing public expenditures in Algeria. Published research, Studies Journal, Economic Issue, University of Laghouat, Laghouat, Algeria.
4. Al-Jubouri, H. D. T. M., & Al-Ramli, A. M. R. (2021). Measuring and analyzing the relationship between government spending and GDP in the Iraqi economy (1990-2018). Published research, Journal of Economic, Financial, and Accounting Studies, Baghdad, Iraq.
5. Al-Janahi, R. J. K. (2021). Unemployment in Iraq: Causes, effects, and solutions. Published research, Journal of the College of Education for Girls in Humanities, 29, Baghdad, Iraq.
6. Zerouat, F. Z., & Menad, M. (2016). Development of public expenditures in Algeria and its impact on economic growth (1999-2014). Published research, Finance and Markets Journal, University of Mostaganem, Mostaganem, Algeria.
7. Zghair, I. A. (2017). The relationship between public spending and overall and sectoral growth rates in Iraq (2004–2015). Iraqi Ministry of Planning, Sector Planning Department, Baghdad, Iraq.
8. Zidan, A. S., & Abdulhussein, N. A. (2022). Unemployment and its impact on crime. Published research, Journal of the College of Jurisprudence, 1(38-39), Baghdad, Iraq.
9. Sahnoun, F. (2010). Measuring the impact of some economic indicators on foreign direct investment: A case study of Algeria. Master's thesis, Ferhat Abbas University, Faculty of Economic Sciences, Commercial Sciences, and Management Sciences, Setif, Algeria.
10. Al-Salman, M. A. M., & Al-Bakr, A. B. (2016). Concept of Gross Domestic Product: A descriptive study. Saudi Arabian Monetary Authority, Riyadh, Saudi Arabia.
11. Al-Sharabi, M. Z. (2013). The impact of general government spending on some sustainable development variables in Algeria (1995-2009). Published research, Rafidain Development Journal, 35(113), Baghdad, Iraq.
12. Al-Sheikhly, A. A. J. S. (2019). Measuring and analyzing the impact of deposits with commercial banks on economic growth in Iraq (2004-2018). Master's thesis, Tikrit University, College of Administration and Economics, Tikrit, Iraq.
13. Saleh, A. N. (2023). Analyzing the role of business incubators in addressing the unemployment problem in Iraq (2011-2021) with a strategic vision using SWOT analysis. Published research, Business Economics Journal, 4(5), Baghdad, Iraq.
14. Aboud, A. R. S. (2022). Analyzing the reality of public spending in Libya for rationalization and reform during the period (2012-2019). Published research, Al-Jami' Journal, National Institute of Administration, Tripoli, Libya.
15. Assiri, A. M. (2018). Proposed perspective from the viewpoint of Islamic education to address the unemployment problem and its implications in light of the needs of the Saudi labor market. Journal of the College of Education, 177(2), Saudi Arabia.

16. Mujahid, A. M. (2014). The issue of unemployment in Egypt and its impact on the transitional phase after the January 2011 revolution. Published research, Scientific Journal of Trade Colleges Sector, Al-Azhar University, 11, Egypt.
17. Magdy, N. (2021). Basic economic concepts: Gross Domestic Product. Introductory booklet series, Arab Monetary Fund, 19, Abu Dhabi, UAE.
18. Al-Makssousi, S. (2023). The impact of unemployment on sustainable development indicators in Iraq (2004-2020). Unpublished master's thesis, American University of Science and Technology, Lebanon.

Foreign references:

1. Feil, Alexandre Andre & Schreiber, Dusan, (2017), "Sustainability and sustainable development: unraveling overlays and scope of their meanings", Cadernos EBAPE.BR, Vol. 14, No 3, Article 7, Rio de Janeiro, Brazil.